



# REMUS 100

**Autonomous  
Underwater  
Vehicle**

**Compact**

**Reliable**

**Lightweight**

**100 Meter  
Depth Rating**



**HYDROID**

# Discover » REMUS 100



Hydroid, LLC was founded in 2001 by the inventors of REMUS to allow this remarkable technology to reach a wider market and to provide for continuous product development. REMUS is the product of years of leading edge research and development, which has culminated in the world's most capable family of AUVs.

Hydroid has grown at an amazing rate and to support this growth, Hydroid now has a staff of over twenty full- and part-time employees that continuously strive for the highest level of product quality and support. This team is enhanced by the organization's growing representative network, which provides local sales and support in nearly 30 nations around the globe.

Hydroid is located in a brand new, state-of-the-art facility located on Cape Cod in Pocasset, Massachusetts. This facility has been uniquely designed to support Hydroid's growing product offerings.

Since its inception, Hydroid has delivered a continuous stream of products through a highly efficient and well organized manufacturing system, which allows for volume production of REMUS vehicles, tracking transponders, and other system components. The result is a highly repeatable system that produces quality products in a timely and efficient manner.

Hydroid's products are backed by the organization's skilled customer service staff, which provides on-site training, system commissioning, and continuous product service and support.



**HYDROID**

Photo courtesy of: John Perry Fish

# » REMUS 100

## FEATURES

**COMPACT SIZE & WEIGHT:** The compact size of the REMUS 100 allows for economical overnight shipping and one-man deployment and operation capability. The REMUS 100 also eliminates the need for larger vessels and costly special handling equipment.

**PROVEN RELIABILITY:** With a track record second to none, the REMUS 100 is the only compact AUV to be selected by the U.S. Navy Fleet for their mine counter measure operations. The system boasts over five years of continuous product development and thousands of hours of field operations.

**EASE OF OPERATION:** An intuitive graphical user interface (GUI) allows anyone to become an AUV operator with just a few hours of training.

**POWERFUL & VERSATILE:** The REMUS 100 contains a full suite of standard sensors, with new sensors being integrated on a continuous basis. In its standard configuration, the REMUS 100 collects the following data:

- ▣ Acoustic Doppler Current Profiling (ADCP)
- ▣ Navigation Data Including: Long Baseline (LBL), Ultra Short Baseline (USBL), and Dead Reckoning Accuracies
- ▣ Side Scan Sonar
- ▣ Conductivity and Temperature
- ▣ Bathymetry
- ▣ Heading, Roll and Pitch
- ▣ Sound Speed
- ▣ Mission Progress
- ▣ System Status

## APPLICATIONS

- ▣ Hydrographic Surveys
- ▣ Mine Counter Measure Operations
- ▣ Harbor Security Operations
- ▣ Environmental Monitoring
- ▣ Debris Field Mapping
- ▣ Search and Salvage Operations
- ▣ Fishery Operations
- ▣ Scientific Sampling and Mapping

## OPTIONAL SENSORS

- ▣ GPS
- ▣ Fluorometers
- ▣ CTDs
- ▣ Multiple Vehicle Capability
- ▣ Iridium
- ▣ Dual-frequency Side Scan Sonar 900/1800 kHz
- ▣ Various Frequencies of Side Scan Sonar: 300 kHz, 600 kHz, 900 kHz and 1,200 kHz.
- ▣ Trackpoint Capability
- ▣ A-Comm Modem
- ▣ DIDSON
- ▣ Video Camera
- ▣ Inertial Navigation Unit

After years of development at the Woods Hole Oceanographic Institute (WHOI), the world's most powerful, compact AUV is now commercially available only through Hydroid, LLC.

REMUS (Remote Environmental Monitoring Units) is the culmination of years of leading edge research and development, combined with a proven track record for highly reliable and repeatable field operations.

The capabilities of the REMUS 100 make it ideally suitable for scientific, commercial and/or military operations. The vehicle is small enough to be carried by one man, yet contains enough sophisticated sensor, navigation, and power resources to enable it to perform intricate sonar and oceanographic surveys over large areas.

## SPECIFICATIONS

Vehicle Diameter	19 cm (7.5 in)
Vehicle Length	160 cm (63 in)
Weight in Air	37 kg (<80 lbs)
Trim Weight	1 kg (2.2 lbs)
Maximum Operating Depth	100 meters (328 ft)
Energy	1 kw-hr internally rechargeable Lithium ion
Endurance	22 hours at optimum speed of 1.5 m/s (3 knots) >8 hours at 2.6 m/s (5 knots)
Propulsion	Direct dive DC brushless motor to open 3-bladed propeller
Velocity Range	Up to 2.6 m/s (5 knots) variable over range
Control	2 coupled yaw and pitch fins
On/Off	Magnetic switch
External Hook-up	2-pin combined Ethernet, vehicle power and battery charging; 4-pin serial connector
Navigation	Long baseline; Ultra short baseline; Doppler-assisted dead reckoning
Transponders	20–30 kHz operating frequency range
Tracking	Emergency transponder, mission abort, and in-mission tracking capabilities
Standard Sensors	Acoustic Doppler Current Profiler (ADCP) Side Scan Sonar Conductivity & Temperature
Software	GUI-based laptop interface for programming, training, post-mission analysis, documentation, maintenance, and troubleshooting
Data Exporting & Reporting	HTML report generator, direct Matlab and ASCII text export
Shipping	2 reusable cases for all equipment, each less than 150 lbs (suitable for overnight transport)

# » THE ANATOMY OF AUTONOMY



**Operation Speed**  
Programmable to operate at speeds up to 5 knots.

**Side Scan Sonar**  
Side scan sonar designed specifically for the demanding AUV environment. The compact, light weight design incorporates the same proven technology found in traditional towed configurations.

**REMUS 100 Vehicle**  
100 Meter Depth Rating.

**Chemical Light Bracket**  
For night time operation.

**Navigation Transponders**  
Four small, lightweight transponders are supplied as reference beacons for the vehicle during operation. The transponders are preset to listen for a specific signal, which is transmitted by the vehicle, and then immediately reply. The vehicle may then easily compute the slant range to the transponder.



**Acoustic Doppler Current Profiler (ADCP)/Doppler Velocity Log (DVL)**  
The specially designed Teledyne RD Instruments ADCP/DVL can be configured to include both downward and upward looking transducers, allowing for bi-directional current profiling, 3-D bottom track, altitude measurement and highly accurate dead reckoning navigation input. The altitude measurement, when coupled with the vehicle's position and depth, also provides seafloor bathymetry.

**Conductivity and Temperature**  
The vehicle is equipped with a multi-parameter sensor sonde, which includes temperature and conductivity. Temperature information is stored in the REMUS 100's hard drive for plotting a profile of the water temperature in the search area. Conductivity and temperature inputs are used to accurately determine the speed of sound in water, which is used to increase navigational accuracy.

**Magnetic On/Off Switch**

**Navigation**  
The REMUS 100 navigates during a mission using three methods: Long Baseline (LBL), Dead Reckoning (DR) and Ultra-Short Baseline (USBL). The on-board computer automatically determines the preferred method, and can vary it through the mission.

**Power/Data Interface Module**  
This module serves as an external power supply to recharge the Li-Ion batteries and to preserve the batteries when conducting on shore testing. It also provides a high-speed communications link to the vehicle, allowing data to be downloaded to one or more computers.

**Acoustic Transducer and Cable**  
Portable low-drag transducer transmits and receives wideband signals from the vehicle and transponders to the Ranger unit.

**REMUS Ranger**  
The REMUS 100 vehicle carries an emergency transponder, completely independent of the vehicle's other systems that may be interrogated at any time. The Ranger is a small, waterproof deck unit, designed to give the operator the ability to monitor the vehicles progress, via this transponder while the mission is underway. The Ranger consists of a highly portable deck unit connected to a small, towed transducer. The front panel display indicates the real-time range to the vehicle in meters and/or is used to send selected commands such as "abort mission" or "come home" to the vehicle during operation.

**Ruggedized Laptop Computer**  
Includes intuitive graphical user interface designed for simple pre-launch checkout, mission planning, and data reporting.



**YOUR LOCAL HYDROID REPRESENTATIVE**

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